

## CHAPTER 8

### FINAL DESIGN AND PREPARATION OF CONTRACT DOCUMENTS

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#### 8-1. General

Upon authorization of the approval authority, the final design of the approved concept will be implemented and the necessary project construction documents will be prepared in accordance with the requirements of the Basic Design Manual and the applicable provisions of the SDG and this manual.

#### 8-2. Final Design

The final design will be done on the basis of the results from the detailed structural analysis, development of design concepts, and the cost benefit analysis as directed by the approval authority. The final design will include a complete analysis of the upgraded structure, completed drawings of all details for the project, and a detailed cost estimate. The final documents will be complete in themselves, without the need to refer to the previous analysis and development work.

#### 8-3. Preparation of project documents

*a. Design analysis.* A design analysis conforming to agency standards will be provided with final plans. This analysis will include seismic design computations for the determination of earthquake forces on the building, for the structural evaluation of the existing building, and for the upgrading of the existing structure, including stresses in the lateral-force-resisting elements and their connections, and the resulting lateral deflections and interstory drifts. The first portion of the design analysis, called the Basis of Design, will contain the following specific information:

(1) A statement on the methodology used for determining the ground motion criteria and a description of the response spectra for which the existing building will be evaluated and the upgraded structure will be designed.

(2) A description of the existing structural system and the structural system selected for upgrading the building to resist lateral forces. Include a discussion of the reasons for its selection.

If irregular conditions exist, a statement describing special analytical procedures to account for the irregularities will be submitted for review and approval by the approval authority.

(3) A statement regarding compliance with this manual, including the values selected for damping, the criteria used for capacities and deformations of structural elements, and the method to determine deformation compatibility between existing and new structural elements.

(4) Any possible assumed future expansion for which provisions are made.

*b. Drawings.* Preparation of drawings will conform to agency standards for ordinary construction with the following additional specific requirements for seismic construction:

(1) Preliminary construction drawings will contain a statement that seismic design will be incorporated in accordance with this manual. The Basis of Design submitted with these drawings will include the information outlined in paragraphs *a*(1) through *a*(4) above.

(2) Construction drawings for seismic areas will include the following additional special information:

(*a*) A statement on the seismic ground motion criteria including the design peak ground accelerations and related response spectra.

(*b*) A statement on the lateral-force design criteria including a tabulation of the periods of vibration and equivalent design lateral forces and other factors.

(*c*) Assumptions made for future extensions or additions.

*c. Specifications.* Preparation of specifications will conform to agency standards for ordinary construction with additional specific requirements that relate to seismic construction and to upgrading of existing construction.

*d. Cost estimate.* Prepare a detailed cost estimate for the upgrading project.